INDUSTRY FACT SHEET

1. APPLICANT INFORMATION

A. Applicant: Washington State Dept. of Ecology and CH2M Hill, Inc

Facility (Site) Name Lilyblad Petroleum Remediation Site

B. Mailing Address 1100 112th Ave. S. Suite 400

C. Facility Address 2244 Port of Tacoma Road

D. Permit Contact with signatory authority Martin Powers
Title CH2M Hill Project Manager
Phone 425.233.3496
2nd Permit Contact: Brian Tracy Title CH2M Hill
Phone 425.233.3414

E. Federal Category N/A NAICS: 562910 – Groundwater Remediation

F. Wastewater Treatment Plant Receiving Wastewater CTP 1

G. Stormwater Basin Lincoln Ave Ditch, Blair Waterway

2. SITE HISTORY

This project is located at the former site of Lilyblad Petroleum, Inc. where Washington State Dept. of Ecology (DOE) has determined that soil and groundwater is contaminated with 23 constituents of concern, consisting mainly of petroleum hydrocarbons and toxic organic compounds from past industrial activity on the site. Lilyblad Petroleum is no longer in business, and the property is owned by M & G Holdings.

Facilities that occupy part of the site include JM Eagle (PW Pipe) and Pacific Functional Fluids, LLC. In 2000, Lilyblad was ordered by DOE to keep the plume of contamination from flowing off the property. Trenches and extraction wells were installed to help contain the plume. In 2003, DOE approved a pilot test to treat some areas, which was shut down in 2006.

Now, under an Enforcement Order, DOE has assumed responsibility for soil and groundwater remediation and issued an intent to incur a lien to secure their interest in the property. CH2M Hill has been contracted by DOE to operate a dual phase (vacuum) extraction soil and groundwater remediation system. Treatment equipment owned by DOE will be located next to Port of Tacoma Road on property now occupied by Pacific Functional Fluids, LLC (PFF). However, PFF is not responsible for the equipment or any

part of the groundwater treatment system. Treated groundwater will discharge below grade, into the existing side sewer, serving the Pacific Functional Fluids office building, that connects to the municipal sanitary main in Port of Tacoma Road.

PFF has no responsibility for the remediation system. They are only responsible for treatment and disposal of boiler blowdown and contact storm water from their facility, including the tank farm, under a separate NPDES permit to discharge treated water to the storm drain. The adjacent contaminated property, now occupied by PW Eagle, is covered by buildings and impervious pavement. Untreated stormwater runoff from that property is conveyed through the municipal storm sewer.

2. DESCRIPTION OF OPERATION

Dual phase extraction (DPE) will be used to remove volatile and semi-volatile organic compounds in both soil and groundwater at a site now occupied by Pacific Functional Fluids and PW Eagle (PW Pipe). Air stripping, bag filtration, and carbon adsorption will be used to remove contaminants from the extracted groundwater before it is discharged to the sanitary sewer. As groundwater treatment operations continue, it is expected that pollutant concentrations will decline to levels where air stripping will no longer be needed, and water will be treated with particulate filters and granulated activated carbon. It is estimated that it will take between 8 and 24 months to pump the groundwater down to a level below the area of contamination. When groundwater is pumped down, soils will be treated by vapor extraction.

3. DESCRIPTION OF DISCHARGE

A. Groundwater Pretreatment Process and Equipment

Groundwater will be extracted from a total of 72 wells located throughout the site. The extraction wells are organized into nine separate manifold systems that employ (2) 300 cubic feet per minute (cfm) vacuum blowers to extract subsurface vapors and enhance groundwater recovery; a 650 cfm air/water separator, and a 40 gallon per minute (gpm) groundwater transfer pump.

The treatment system is designed to treat up to 40 gallons per minute (gpm). It consists of:

1. 300 gallon polyethylene holding tank with high level switch;
2. Air Stripper, Model QED 40 gpm – Induced Draft, to remove volatile organic compounds from the liquid waste stream;
3. (2) 100 gpm capacity bag filters for solids removal; and
4. Liquid Phase Carbon Treatment consisting of (2), 500 lb carbon vessels arranged in series with 40 gpm capacity in each vessel.

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The estimated groundwater flow from each well is 0.1 gallons per minute (gpm). Two manifold systems (approximately 24 wells) will be under vacuum for extraction at any given time, on a rotating basis. The system is expected to generate an average anticipated volume of approximately 2 gpm, with a maximum anticipated flow of 35 gpm. Flow is anticipated to be in the higher range during the initial weeks of operation while groundwater levels are lowered.

B. Waste Treatment Data

Efficiency data for the QED Air Stripper Model ver.cl.10 was submitted, indicating removal efficiency for the organic pollutants is high for all tested constituents except pentachlorophenol, bi(2-chloroethyl) ether, and MEK. The air stripper effluent will be further treated by a granulated activated carbon filter that is expected to remove remaining pollutants. Sampling data from a similar system used to treat groundwater from this site between 2003 and 2006 show that pollutants were effectively removed by air stripping followed by carbon filtration (see attached spreadsheet).

4. RATIONALE FOR WASTEWATER DISCHARGE LIMITATIONS

A. Categorical Standards – Not applicable

B. Combined Waste Steam Formula – Not applicable

C. Local Limits

Discharge limits for this permit will be those listed in Tacoma Municipal Code Chapter 12.08. The total concentration (sum of the reported concentrations) of Total Toxic Organics (TTO) that are reported at concentrations of 10 ppb or greater, or are reported to be present below a method reporting limit of 10 ppb or greater, will be limited to 2.13 mg/l.

D. Categorical Standard/Local Limit Comparison – Not applicable

E. Best Professional Judgment

Although the City of Tacoma has not codified a TTO limit, Best Professional Judgement leads us to employ the TTO limit of 2.13 mg/l (calculated by adding the concentrations of all pollutants present at, or with a PQL of, 10 ug/l or greater) imposed for industries subject to federal categorical regulations.

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Wastewater Discharge Limitations

Parameters	Units	Daily Maximum
Arsenic	mg/L	0.1
BETX	mg/L	10 [1]
Cadmium	mg/L	0.25
Chromium, Total	mg/L	1.0
Chromium^{+6}	mg/L	0.25[2]
Copper	mg/L	1.0
Lead	mg/L	0.4
Mercury	mg/L	0.05
Nickel	mg/L	1.0
pH within the range of	units	5.5-11.0
Total Petroleum [3]Hydrocarbons	mg/L	50 [4]
Volatile and Semi-Volatile Organics	mg/L	2.13 [5]
Zinc	mg/L	2.0
Flow	gpm	40

[1] Benzene may not exceed 0.5 ppm.
[2] Analysis for Chromium $^{+6}$ is only required if Total Chromium exceeds 0.25 mg/l
[3] As Silica Gel Treated Hexane Extractable Material (SGT-HEM).
[4] No free floating oil or visible sheen is allowed.
[5] Total of all concentrations(or method reporting limits if not detected) equal to or greater than 10 ug/l)) (except benzene, ethylbenzene, toluene, and xylene-(See BETX)

No discharge of flammable solvents or pollutants which may create a fire or explosion hazard in the municipal sewer system shall be allowed including, but not limited to, wastewater with a closed cup flashpoint of less than 140 °F or 60 °C using test methods prescribed in 40 CFR 261.21.

No discharge of potentially toxic or harmful materials, other than those listed above, is permitted unless specifically approved by TACOMA. Specific limitations may be placed on other parameters, if determined appropriate by TACOMA.

5. MONITORING REQUIREMENTS

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Parameter	Sampling Frequency	Type of Sample	EPA Analysis Method
pH	Quarterly	Grab	1 50.1
Total Petroleum Hydrocarbons	Quarterly	Grab	1664
Metals, Total	[Aliquot/time], Quarterly	Composite	200.7
Semi-Volatile Organic Constituents	[Aliquot/time], Quarterly	Composite	625
Volatile Organic Constituents including xylenes	Quarterly	Grab	624
Flow	Continuously	Metered	

A. Frequency and Type

The discharge from the treatment system will be sampled for all parameters listed above within 30 days of startup to confirm that the discharge is in compliance with discharge limits. Additional sampling and analysis shall be done quarterly, with analysis results submitted to Environmental Services on or before the 15th day of the month following the end of each calendar quarter (i.e., the 15th day of January, April, July, and October.)

1. Grab vs. Composite

a. Aliquot volume/time for composite samples

For metals and semi-volatile organics, flow proportional samples should be composited for a period of 24 hours. If flow proportional sampling is not practical, equal aliquots of no less than 100 ml should be taken at evenly spaced time intervals of no less than 15 minutes, over one 24 hour period each quarter.

b. Number of grabs/time

One grab sample shall be taken each quarter for pH, petroleum hydrocarbons (as silica gel treated-hexane extractable materials), and volatile organics.

6. MONITORING LOCATIONS

All parameters shall be sampled at the end of the treatment system, before the water enters the sanitary sewer.

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7. REPORTING REQUIREMENTS

A. Routine Reporting

1. Sampling and analysis shall be done for all parameters listed in Section T1.A of the permit within 30 days of the treatment system startup; the analysis report shall be submitted to ESCS within 15 days after it is received by DOE. Daily average flow measurement shall also be provided for the first 30 days of operation. Subsequent reports containing sampling analysis data and flow volume shall be submitted quarterly.

B. Signatory Requirements
DOE will delegate CH2M Hill Project Manager, Martin Powers, to have signatory authority for all permit related reports and documents.

6. SPECIAL REQUIREMENTS

A. Slug Discharge and Accidental Spill Prevention Plan
There is no risk of slug discharge or accidental spill at this site. Therefore, an Accidental Spill Prevention Plan will not be required.

B. Contact Stormwater – Not applicable

C. Compliance Schedule – Not applicable

D. Waste Charaterization – Not applicable